

WE CLAIM

1. (Previously Amended) A method for generating and transmitting bit rate conversion information, the method comprising: receiving a sequence of media signals, the sequence of media signals to be transmitted over a communication channel; applying at least two bit rate conversion schemes on the sequence of media signals; and analyzing the results of the appliance of the at least two bit rate conversion schemes to provide bit rate conversion information to be sent to multiple controllers that determine whether to apply bit rate conversion in response to bit rate conversion information.
2. (Previously Amended) A method for generating and transmitting bit rate conversion information, the method comprising: receiving a sequence of media signals, the sequence of media signals to be transmitted over a communication channel; applying at least two bit rate conversion schemes on the sequence of media signals; and analyzing the results of the appliance of the at least two bit rate conversion schemes to provide bit rate conversion information; and transmitting at least a portion of the bit rate conversion information over the communication channel along with the sequence of media signals.
3. (Previously Amended) The method of claim 2 wherein the step of transmitting at least a portion of the bit rate conversion information is preceded by a step of multiplexing at least a portion of the bit rate conversion information with the sequence of media signals.
4. (Previously Amended) The method of claim 2 wherein the bit rate conversion information indicates (a) the at least two bit rate conversion schemes applied on the sequence of media signals, and (b) at least two amounts of bit rate conversion resulting from the appliance of the at least two bit rate conversion schemes.
5. (Previously Presented) The method of claim 4 wherein the bit rate conversion information further indicates at least one quality loss resulting from the appliance of the at least two bit rate conversion schemes.
6. (Previously Presented) The method of claim 1 wherein the bit rate conversion schemes are selected from a group consisting of:
 - removing filler packets;

removing filler frames;
removing stuffing bits;
selectively scaling DCT coefficients to zero;
selectively setting DCT coefficients to zero;
discarding data used to represent selected media frames;
discarding data used to represent selected media frames and generating repeat information in the bit stream such that a decoder can repeat the dropped frames;
re-quantizing quantized DCT coefficients;
extracting and changing the quantization scale factors;
decode and encode at different bit rates; and
changing the resolution of a video image.

7. - 8. (Cancelled)

9. (Previously Presented) The method of claim 2 wherein the media signals are selected from a group consisting of:

signals representative or visual information;
compressed signals representative of visual information;
MPEG compliant signals;
signals representative of audio information;
compressed signals representative of audio information;
information signals associated with signals representative of visual information;
information signals associated with compressed signals representative of visual information;
information signals associated with MPEG compliant signals;
information signals associated with signals representative of audio information;
in formation signals associated with compressed signals representative of audio in formation; and
sequences of media signals.

10. (Cancelled)

11. (Previously Amended) In a distribution center configured to transmit a plurality of media streams to a plurality of receivers that determine whether to apply bit rate

conversion schemes, a method for generating and transmitting bit rate conversion information, the method comprising:

receiving at least one media stream, the at least one media stream to be transmitted over a communication channel;

applying at least one bit rate conversion scheme on the at least one media stream;

analyzing the results of the appliance of the at least one bit rate conversion scheme to provide bit rate conversion information to be transmitted to the plurality of receivers.

12. (Previously Amended) In a distribution center configured to transmit a plurality of media streams, a method for generating and transmitting bit rate conversion information, the method comprising: receiving at least one media stream, the at least one media stream to be transmitted over a communication channel; applying at least one bit rate conversion scheme on the at least one media stream; analyzing the results of the appliance of the at least one bit rate conversion scheme to provide bit rate conversion information; and transmitting at least a portion of the bit rate conversion information over the communication channel along with the at least one media stream.

13. (Original) The method of claim 12 wherein the step of transmitting at least a portion of the bit rate conversion information is preceded by a step of multiplexing the at least portion of the bit rate conversion information with the at least one media stream.

14. (Previously Presented) The method of claim 12 wherein the bit rate conversion information indicates (a) at least two bit rate conversion schemes applied on the at least one media stream, and (b) at least two amounts of bit rate conversions resulting from the appliance of the at least two bit rate conversion schemes.

15. (Original) The method of claim 14 wherein the bit rate conversion further indicates at least one quality loss resulting from the appliance or the at least one bit rate conversion scheme.

16. (Previously Amended) The method of claim 11 wherein the bit rate conversion schemes are selected from a group consisting of:

removing filler packets;

removing filler frames;
removing stuffing bits;
selectively scaling DCT coefficients to zero;
selectively setting DCT coefficients to zero;
discarding data used to represent selected media frames;
discarding data used to represent selected media frames and generating repeat information in the bit stream such that a decoder can repeat the dropped frames;
re-quantizing quantized DCT coefficients;
extracting and changing the quantization scale factors ;
decode and encode at different bit rates; and
changing the resolution of a video image.

17. (Previously Presented) The method of claim 11 wherein the steps of applying and analyzing are repeated to produce bit rate conversion information indicative of results of an appliance of a sequence of bit rate conversion schemes on the at least one media streams.

18. (Previously Amended) In a distribution center configured to transmit a plurality of media streams, a method for generating and transmitting bit rate conversion information, the method comprising: receiving at least one media stream, the at least one media stream to be transmitted over a communication channel; applying at least one bit rate conversion scheme on the at least one media stream; analyzing the results of the appliance of the at least one bit rate conversion scheme to provide bit rate conversion information; wherein the steps of applying and analyzing are repeated to produce bit rate conversion information indicative of results of an appliance of a sequence of bit rate conversion schemes on the at least one media stream; wherein the method further comprises

transmitting the bit rate conversion information and the at least one media stream until there is a need to convert the bit rate of a media stream out of the at least one media stream by applying a first bit rate conversion scheme out of the sequence of bit rate conversion schemes; and

applying the first bit rate conversion scheme, and discarding bit rate conversion information relating to a first bit rate conversion information to provide modified bit rate conversion information.

19. (Original) The method of claim 11 wherein each media stream includes signals selected from a group consisting of:

signals representative of visual information;

compressed signals representative of visual information;

MPEG compliant signals;

signals representative of audio information;

compressed signals representative of audio information;

information signals associated with signals representative of visual information;

information signals associated with compressed signals representative of visual information;

information signals associated with MPEG compliant signals;

information signals associated with signals representative of audio information;

information signals associated with compressed signals representative of audio information; and

sequences of media signals.

20 - 25 (Cancelled)

26. (Currently Amended) A method for modifying a bit rate of a sequence of media signals such that the bit rate of the sequence of media signals does not exceed an available bandwidth of a communication channel, the method comprising the steps of:

receiving, at a headend, the sequence of media signals, bandwidth information and bit rate conversion information[[.]]; wherein the sequence of media signals comprises at least two media signals, each of the at least two media signals associated with bit rate conversion information; and wherein the media signals and the bit rate conversion information are received over a communication channel from a distribution center;

selecting at least one of the at least two media signals to be provided to the channel having the available bandwidth;

determining whether to convert the bit rate of the sequence of media signals in view of bandwidth information and the bit rate conversion information; and

converting the bit rate of the sequence of media signals in response to the determination and in response to the selection;

~~wherein the sequence of media signals comprises at least two media signals, each of the at least two media signals associated with bit rate conversion information;~~

~~wherein each of the bit rate converted sequence of media signals is representative of at least a portion of a program;~~

~~wherein the method further comprising a step of selecting at least one of the at least two sequences media signals to be provided to the channel having the available bandwidth and wherein converting the media signals in view of the selection;~~

~~wherein the step of receiving is preceded by a step of multiplexing the at least two sequences of media signals ; and~~

~~wherein the step of multiplexing is preceded by a step of generating bit rate conversion information.~~

27 - 28. (Cancelled)

29. (Previously Amended) A method for modifying a bit rate of a sequence of media signals at a headend such that the bit rate of the sequence of media signals does not exceed an available bandwidth of a communication channel, the method comprising the steps of:

receiving the sequence of media signals, bandwidth information and bit rate conversion information;

determining whether to convert the bit rate of the sequence of media signals in view of bandwidth information and the bit rate con version information; and

converting the bit rate of the sequence of media signals in response to the determination;

wherein the bit rate conversion information is multiplexed with the media signals at a distribution center;

wherein the bit rate conversion information is generated by a central analyzer at a distribution center.

30 - 34. (Cancelled)

35. (Previously Amended) A method for modifying a bit rate of a sequence of media signals at a headend such that the bit rate of the sequence of media signals does not exceed an available bandwidth of a communication channel, the method comprising the steps of:

receiving the sequence of media signals, bandwidth information and bit rate

conversion information, wherein the sequence of media signals and bit rate conversion information are received from a distribution center;

determining whether to convert the bit rate of the sequence of media signals in view of bandwidth information and the bit rate conversion information; and

converting the bit rate of the sequence of media signals wherein the media signals are MPEG compliant signals;

wherein the media signals are arranged in MPEG compliant transport packets;

wherein the bit rate conversion information is embedded within the headers of the transport packets at a distribution center.

36 - 37. (Cancelled)

38. (Currently Amended) An apparatus for generating and transmitting bit rate conversion information from a distribution center to a headend, the apparatus comprising:

at least one bit rate converter for receiving a sequence of media signals to be transmitted to the headend over a communication channel, and for applying at least one bit rate conversion scheme on the sequence of media signals to provide a bit rate converted sequence of media signals;and

at least one bit rate conversion analyzer, coupled to the at least one bit rate converter, for receiving and analyzing the bit rate converted sequence of media signals and providing bit rate conversion information[[.]];

wherein the apparatus is further configured to transmit the bit rate conversion information and the sequence of media signals to multiple receivers.

39. (Original) The apparatus of claim 38 further comprising a transmitter, coupled between the at least one bit rate conversion analyzer and the communication channel, for receiving and transmitting over the communication channel at least a portion of the bit rate conversion information.

40. (Previously Presented) The apparatus of claim 38 further comprising a multiplexer, coupled between the at least one bit rate conversion analyzer and the communication channel, the multiplexer receives and multiplexes the sequence of media signals and at least a portion of the bit rate conversion information.

41. (Original) The apparatus of claim 38 wherein the bit rate conversion information indicates (a) the at least one bit rate conversion scheme applied on the sequence of

media signals, and (b) at least one amount of bit rate conversion resulting from the appliance of the at least one bit rate conversion scheme.

42. (Original) The apparatus of claim 41 wherein the bit rate conversion further indicates at least one quality loss resulting from the appliance of the at least one bit rate conversion scheme.

43. (Previously Presented) The apparatus of claim 38 wherein the bit rate conversion schemes are selected from a group consisting of:

removing filler packets;

removing filler frames;

removing stuffing bits;

selectively scaling DCT coefficients to zero;

selectively setting DCT coefficients to zero;

discarding data used to represent selected media frames;

discarding data used to represent selected media frames and generating repeat information in the bit stream such that a decoder can repeat the dropped frames;

re-quantizing quantized DCT coefficients;

extracting and changing the quantization scale factors;

decode and encode at different bit rates; and

changing the resolution of a video image.

44. (Previously Presented) The apparatus of claim 38 wherein at least one pair of bit rate converter and bit rate conversion analyzer apply a sequence of bit rate conversion schemes on a sequence of media signals and provide bit rate conversion information indicative of results or the appliance of the sequence of bit rate conversion schemes on the sequence of media signals.

45. (Original) The apparatus of claim 38 wherein the media signals selected from a group consisting of: signals representative of visual information;

compressed signals representative of visual information;

MPEG compliant signals;

signals representative of audio information;

compressed signals representative of audio information;

information signals associated with signals representative of visual information;

information signals associated with compressed signals representative of visual information; information signals associated with MPEG compliant signals;

information signals associated with signals representative of audio information;

information signals associated with compressed signals representative of audio

information; and

sequences of media signals.

46. (Canceled)

47. (Original) The apparatus of claim 46 being located within a central distribution center.

48. (Original) The apparatus of claim 46 where in the receivers are local distribution centers.

49. (Previously Amended) An apparatus for generating and transmitting bit rate conversion information from a distribution center to a headend, the apparatus comprising:

At least one bit rate converter for receiving at least one stream of media signals to transmitted over a communication channel to a headend, and

for applying at least one bit rate conversion scheme on the at least one media stream to provide at least one bit rate converted stream of media signal;

at least one bit rate conversion analyzer, coupled to the at least one bit rate converters, for receiving and analyzing the at least one bit rate converted stream of media signals and for providing bit rate conversion information.

50. (Original) The apparatus of claim 49 further comprising a transmitter, coupled between the at least one bit rate conversion analyzer and the communication channel, for receiving and transmitting over the communication channel al least a portion of the bit rate conversion information.

51. (Previously Presented) The apparatus of claim 49 further comprising a multiplexer, coupled between the at least one bit rate conversion analyzer and the communication channel, the multiplexer receives and multiplexes the at least one media stream and at least a portion of the bit rate conversion information.

52. (Original) The apparatus of claim 49 wherein the bit rate conversion information indicates (a) the at least one bit rate conversion scheme applied on the at least one media stream, and (b) at least one amount of bit rate conversion resulting from the appliance of the at least one bit rate conversion scheme.

53. (Original) The apparatus of claim 52 wherein the bit rate conversion further indicates at least one quality loss resulting from the appliance of the at least one bit rate conversion scheme.

54. (Previously Presented) The apparatus of claim 49 wherein the bit rate conversion schemes are selected from a group consisting of:

removing filler packets;

removing filler frames;

removing stuffing bits;

selectively scaling DCT coefficients to zero;

selectively setting DCT coefficients to zero;

discarding data used to represent selected media frames;

discarding data used to represent selected media frames and generating repeat information in the bit stream such that a decoder can repeat the dropped frames;

re-quantizing quantized DCT coefficients;

extracting and changing the quantization scale factors;

decode and encode at different bit rates; and

changing the resolution of a video image.

55. (Previously Presented) The apparatus of claim 49 wherein at least one pair of bit rate converter and bit rate conversion analyzer apply a sequence of bit rate conversion schemes on a at least one media stream and provide bit rate conversion information indicative of results of the appliance of the sequence of bit rate conversion schemes on the at least one media stream.

56. (Original) The apparatus of claim 49 wherein the media streams comprising at least one signal selected from a group consisting of:

signals representative of visual information;

compressed signals representative of visual information;

MPEG compliant signals;

signals representative of audio information;

compressed signals representative of audio information;
information signals associated with signals representative of visual information;
information signals associated with compressed signals representative of visual information;
information signals associated with MPEG compliant signals;
information signals associated with signals representative of audio information;
information signals associated with compressed signals representative of audio information; and
sequences of media signals.

57. (Currently Amended) The apparatus of claim 49 further configured to transmit the bit rate conversion information and the sequence stream of media signals to multiple receivers.

58. (Original) The apparatus of claim 49 being located within a central distribution center.

59. (Currently Amended) The apparatus of claim 57 wherein the multiple receivers are local distribution centers.

60. (Currently Amended) An apparatus for modifying a bit rate or a sequence of media signals such that the bit rate of the sequence of media signals does not exceed an available bandwidth of a communication channel, the apparatus comprising:

a controller, coupled to a bit rate converter, for receiving bit rate conversion information and bandwidth information and for determining whether to convert the bit rate of the sequence of media signals in response to the bandwidth information and the bit rate conversion information; wherein the bit rate conversion information is provided from a central analyzer to multiple controllers; and

the bit rate converter, coupled to the controller, for receiving the sequence of media signals, and for converting the bit rate of the sequence of media signals, in response to the determination.

61. (Previously Amended) The apparatus of claim 60 wherein the media signals comprising of at least two sequences of media signals, whereas each of the at least two sequences of media signals is associated with a bit rate conversion information.

62. (Original) The apparatus of claim 60 wherein each of the at least two sequences of media signals is representative of at least a portion of a program.

63. (Previously Presented) The apparatus of claim 62 wherein the apparatus selects at least one of the at least two sequences to be provided to the communication channel.

64. (Previously Amended) The apparatus of claim 62 further comprising a multiplexer, coupled between the communication channel and the bit rate converter, for multiplexing the at least two sequences of media signals.

65. (Previously Presented) The apparatus of claim 60 wherein the bit rate conversion information being indicative of a bit rate conversion after performing at least of the following bit conversion step selected from a group consisting of:

removing filler packets;

removing filler frames;

removing stuffing bits;

selectively scaling DCT coefficients to zero;

selectively setting DCT coefficients to zero;

discarding data used to represent selected media frames;

discarding data used to represent selected media frames and generating repeat information in the bit stream such that a decoder can repeat the dropped frames;

re-quantizing quantized DCT coefficients;

extracting and changing the quantization scale factors;

decode and encode at different bit rates; and

changing the resolution of a video image.

66. (Canceled)

67. (Previously Amended) The apparatus of claim 60, wherein the bit rate conversion information is multiplexed with the media signals.

68. (Previously Amended) The apparatus of claim 60, wherein media signals are associated with priority criteria, and wherein the step of converting the media signals is further based upon a priority associated with the media signals.

69. (Original) The apparatus of claim 60 wherein the media signals are MPEG compliant signals.

70. (Original) The apparatus of claim 60 wherein the media signals are arranged in MPEG compliant transport packets.

71. (Previously Amended) An apparatus for modifying a bit rate of a sequence of media signals such that the bit rate of the sequence of media signals does not exceed an available bandwidth of a communication channel, the apparatus comprising:

a controller, coupled to a bit rate converter, for receiving bit rate conversion information and bandwidth information and for determining whether to convert the bit rate of the sequence of media signals in response to the bandwidth information and the bit rate conversion information; and the bit rate converter, coupled to the controller, for receiving the sequence of media signals, and for converting the bit rate of the sequence of media signals, in response to the determination; wherein the media signals are arranged in MPEG compliant transport packets; and wherein the bit rate conversion information is embedded within the headers of the transport packets.

72. (Previously Amended) An apparatus for modifying a bit rate of a sequence of media signals, based on bit rate conversion information received from a distribution center, such that the bit rate of the sequence of media signals does not exceed an available bandwidth of a communication channel, the apparatus comprising:

a controller, coupled to a bit rate converter, for receiving bit rate conversion information and bandwidth information and for determining whether to convert the bit rate of the sequence of media signals in response to the bandwidth information and the bit rate conversion information;

the bit rate converter, coupled to the controller, for receiving the sequence of media signals, and for converting the bit rate of the sequence of media signals, in response to the determination; where in the apparatus modifies bit rate conversion information to reflect bit rate conversion schemes that were applied by the bit rate converter.

73. (Original) The apparatus of claim 72 wherein the bit rate conversion information being indicative of results of an appliance of sequence of bit rate conversion schemes on the sequence of media signals.